1:Stanford U. S-4, 5 1956 AF16 SW China
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328 Yunnan, Szechwan, and Sikang are centers of China's copper production. During the 1940s, several modern copper refineries using the electrolytic process were operating in Southwest China. They treated ore mined in the region and refined it to a product of 99.95 per cent purity. China's copper production during 1938-45, accounted for largely by the Southwest Region, was as follows:

Table 6. China's Production of Copper* (in metric tons)

Year	Production
1938	477
1939	1,886
1940	2,318
1941	1,591
1942	1,266
1943	500
1944	930
1945	1,179

* Statistical Abstract of the Republic of China, 1947, pp. 28-29.

E. Production of Antimony

135 Another important mineral resource in the Southwest Region is antimony, of which

1: Stanford U. S-4, 5 1956 AF 16 SW China
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439 products and statistics on their production in the Southwest and China as a whole. From these and other relevant data, we can obtain some idea of the Southwest's share in the export of tin, bristles, and tung oil. Because of the practical problems involved in an overall survey of the Southwest's foreign trade, this chapter will be confined to a discussion of the specific products, which are of special significance in the region's export trade.

II. TIN

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328 China's tin production was badly crippled during World War II. Reduced from a high of more than 13,000 metric tons or 7.8 per cent of the world supply outside the Soviet Union in 1938 to a low of 2,000 metric tons in the last years of the war, the nation's output had recovered to only about one-third the 1938 rate at the time of the Communist takeover in 1949. Under the Communists, the production of tin was reported to have reached 6,400 tons in 1953 or about 3.6 per cent of total world production with the exception of the Soviet Union. Most of the increased output was the result of mining expansion in the Ko-chiu area of Yunnan, the major source of China's tin supply.

Tin constitutes a large part of Yunnan's total contribution to the nation's export trade. Under the Nationalist Government, much of China's tin went to the United States to pay the principal and interest on loans granted before and during World War II. However, China was only a minor source of supply for the United States' total tin requirements. (See Table.1.)

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328 Details about the tin trade of Communist China are not now available. China's own needs for tin have undoubtedly increased under the Communist industrialization program, and any exportable surplus easily could have been absorbed by the Communist bloc of nations. Either or both suppositions would account for the complete discontinuance of Chinese tin shipments to Hong Kong after the Communist domination of the Mainland.[1]

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1. See the statistics covering trade between China and Hong Kong published regularly in the Far Eastern Economic Review, Hong Kong.

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Table 1. China's Tin Exports in Relation to the United States' Tin Requirements */

Year	U.S. Imports from China	U.S. Tin Consumption in Manufacturing	Percent of U. S. Requirements Met by Chinese Imports
	[In 1,000 tons]		
1935-39 (aver.)	2.7	77.3	3.43
1940-44 (aver.)	2.7	97.6	2.81
1945	1.9	83.6	2.06
1946	1.0	80.9	1.22
1947	2.6	88.1	3.00
1948	1.6	90.8	1.78
1949	3.7	72.4	5.09
1950	1.7	104.5	1.59
1951	.1	88.2	.62
1952	n. a.	78.4	-
1953	n. a.	85.6	-
1954	n. a.	82.6	-

*/ Commodity Research Bureau, Commodity Yearbook 1955, New York, 1955, p. 335.

1:Stanford U. S-4-5 1956 AF 16 SW China AF/G

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327 when hardened by repeated heatings in the furnace it is made into hatchets, hoes, and tripod stands for cooking-pots.

563 To the north of T'ien-t'ang-kuan is a very interesting country inhabited by the Li-so tribe, which I should much have liked to explore. This race I have found scattered over a very wide extent of country, as far south as the Siamese border, and as far north as the Tibetan parts of Ssŭ-ch'uan and north-western Yün-nan. In the Kachin Hills and the Shan States they are split up into very small and scattered communities, living usually on the very tops of the hills. They originally occupied a good deal of the country to the west and north of T'êng-yüeh, and I have little doubt that the Chinamen of Hsi-lien and many of the neighbouring districts have more Li-so blood in them than Chinese. At present the only district in which the Li-sos form the bulk of the population seems to be the Salween valley from about Lat. 25° 30′ up to Lat. 27° 30′. Their language is closely connected with that of the Lo-los, and they are no doubt a branch of this widely-spread race. I have always found them, like the Lo-los, extremely pleasant and friendly.

Li-so is the Chinese name for this tribe. They call themselves Li-su, and the Kachins know them as Yaw-yen. In T'ien t'ang-kuan they now live on very good terms with their Chinese neighbours, but the remains of a wall round Ma-li-pa and an old two-storied stone tower close by suggest that there was a time when things were not so peaceful. Now-a-days the only enemies of the villagers are wolves, which they say hunt in large packs and will kill even big animals, such as ponies and cattle.

From Ma-li-pa I turned eastward, crossed a range at 8,700 feet by an extremely steep ascent and an equally abrupt descent, rendered more difficult by a drizzling rain. This brought us into the Ming-kuang plain which runs down the Mo-lo Ho in a valley half a mile wide.

328 [316] We slept at the village of Hsiao-hsin-kai, and I found men smelting lead close by. The lead is found in sand and this sand is first washed in a place prepared for the purpose in a small stream. The heaviest part of it which sinks is then taken away and smelted in the furnace. Both lead and

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copper are found in many places in the hills round the Ming-kuang valley, but the miners say it is very uncertain work. They sometimes are lucky and make a lot of money. At other times they do not get enough to pay for the license which they have to get from the Government. 328●

From Ming-kuang, still keeping eastward, we crossed another range by an extremely bad road and reached the Shweli (Lung Chiang) valley. We crossed that river by a type of wooden bridge which is fairly common in Yün-nan. On each bank is a stone pier from which wooden props stick out at an upward angle of about 30°, supported partly by posts from below, and partly by two iron chains from above. A wooden roadway resting on these props stretches out some way across the river from each bank, and the middle part of the bridge is made of five whole trees laid across from the props on one side to the props on the other side.

The river is here some forty yards wide and may be considered as the main branch of the Shweli, though the Mo-lo Ho on which Hsiao-hsin-kai lies is not very much smaller. The Shweli valley in all this part of its course has only a very narrow strip of flat rice fields, but the slope to the hills on the east is very gradual for a breadth of two or three miles, and here there are many villages and a great deal of bean cultivation.

We slept at the large village of Kai-t'ou, the centre of a paper-making district. The paper is of the sort called *pai chih, white paper*, or sometimes *p'i-chih, bark paper*, and is manufactured out of the bark of the *kou* tree, a sort of mulberry, I believe. The bark is first steeped for a day, then boiled with lime, then washed to remove any particles of lime that may adhere to it. It is then pounded with heavy pestles, and the finest pieces are picked out and mixed with water in a large tub to form the pulp. A frame made of very finely split bamboo is then dipped in the water so that a little of the pulp sticks to the top of it. The frame is turned over on to a heap of sheets of paper and the pulp off it when dried becomes the soft white paper, which the Chinese use for writing on. 289

The next day travelling southwards down the Shweli valley we came to the village of Wa-tien which is the centre

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231 them. They plant a particular sort of tree to breed them on. The insects consist of a soft brown shell full of a mass of very minute grubs. Some of these are kept for breeding and are put into little bundles of straw and fastened on to the tree. These little grubs after about a month come out of the shell and spread all over the tree. In a year's time each of these has produced its nest of grubs, and the crop is gathered and sold to men who come chiefly from Ssŭ-ch'uân and Hu-nan. The price is 20 taels (about £3) for a man's load of 50 or 60 lbs. of insects.

The load being so valuable, great care is taken that the grubs should not be prematurely hatched out of their shell by the heat. The porters travel very quickly and only in the cool of the night. On arrival at their homes in Eastern Ssŭ-ch'uan or Hu-nan, they place the insects out on another sort of tree, and in course of time they come out of the shell and spread over the tree and produce wax. When the deposit is complete, as much as possible is scraped off, and the branches are then boiled so as to extract every particle of wax.

373 The white wax which these insects produce is much valued as it will stand a greater heat without melting than any other substance of this sort. It is used therefore principally in the manufacture of candles, as an outer coating to prevent the candle guttering. The gathering and selling of the crop of insects was in full swing as we passed through this part of the country at the end of April[1].

The next day we crossed the Niu-lan Chiang which is only 40 yards wide at the San-tao-kuai ferry but has a strong current and runs in a deep gorge. This river, which is the outlet of the Yang-lin Lake, is navigated by boats in some parts of its course. It forms here the boundary between Kuei-chou and Yün-nan, so that we were now again in the latter province after having been for the last twelve days in Kuei-chou.

• 328 The inhabitants of San-tao-kuai get their living by smelting zinc. The zinc ore is placed in conical shaped earthenware cups. When heated, the zinc rises from the ore in the shape of gas and collects on a sort of shelf inside

[1] For a full account of the White Wax Insect see Hosie's *Three Years in Western China*, Chapter XI.

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the cup near the top. The zinc is sold at about 1½*d.* for 1 lb., and is most of it sent to Yün-nan Fu to be mixed with copper to make cash.

After crossing the river we had a very steep climb of more than 3000 feet, reaching the top of the range at 8,600 feet and descending slightly to Kung-shan, a large mining village. The mine manager was a travelled man who had visited Shanghai, and I found him very civil.

Lead and zinc are the two chief minerals, and the lead ore also produces a small quantity of silver. I was told that the output of lead averages 400 lbs. in a day. The zinc is got out of very deep shafts, extending they say several *li*[1] into the hill-side. I did not test the exact accuracy of this statement, but I went a little way down one shaft and it certainly seemed to be a deep one. They are not sunk straight down but are sloped so that a man can walk down them, though the passage is so low that he has to keep in a bent position most of the way.

On the 1st May our road led us down a narrow valley to the Chê-hai plain, which is about seven miles long and contains a small lake and several villages. The next day after crossing a low range we reached Tung-ch'uan Fu where I was kindly put up by Mr and Mrs Grist and Dr Hicks, the missionaries there. The official then at Tung-ch'uan was a very enterprising man who had established a manufactory of cotton cloth. The yarn is from Bombay, imported by Shanghai and the Yangtze. There was no European machinery: they used the ordinary Chinese looms.

The town walls of Tung-ch'uan do not enclose much space, but there are a good many people living outside the gates, and the whole town and suburbs must contain about 1000 houses. The population appear to be very friendly to foreigners.

The plain is some six miles long by three miles wide. It grows rice well, but the winter crops do not seem to flourish, and the soil does not suit opium. Like Wei-ning

[1] The *li* is a Chinese measure of distance. Theoretically it is about 600 yds. but practically it varies in different parts of the country. In the hilly parts of Yün-nan it runs about five to the mile. Ten li may be usually taken as an hour's march, so that used in this way as a unit of time it is a very useful measure.